Optical Microscope Software for Breast Cancer Diagnosis
Ref. No. E-286-2012

Keywords: Software, Cancer / Neoplasm: Cancer, Other Technology, spatial genome organization

Summary:
The National Cancer Institute seeks parties interested in collaborative research to co-develop diagnostic methods for detection of cancer using spatial genome organization.

Description of Technology:
The successful treatment of cancer is correlated with the early detection of the cancerous cells. Conventional cancer diagnosis is largely based on qualitative morphological criteria, but more accurate quantitative tests could greatly increase early detection of malignant cells. It has been observed that the spatial arrangement of DNA in the nucleus is altered in cancer cells in comparison to normal cells. Therefore, it is possible to distinguish malignant cells by mapping the position of labeled marker genes in the nucleus.

 Researchers from NCI and Rudgers University developed methods of detecting abnormal cells in a sample using the spatial position of one or more genes within the nucleus of a cell, as well as a kit for detecting abnormal cells using such methods. The invention also provides methods of identifying gene markers for abnormal cells using the spatial position of one or more genes within the nucleus of a cell. The application is called PAGODA: Parallel annotation genome organization diagnosis software for breast cancer:

Potential Commercial Applications:
- Software tool for tissue nuclei segmentation, annotation, screening and spartial FISH analysis.
 - Diagnostic for cancer from tumor biopsies after non-invasive techniques such as a mammogram or PSA assay have suggested cancer.

Competitive Advantages:
- Sensitive detection of cancerVery small sample (100-200 cells) reduces the need for invasive procedures
 - Does not require mitotic chromosomesApplicable to solid tumors and blood cancers
 - Single cell assay allows analysis of subpopulations from biopsy
 - Probes to all genomic regions are availableAlternative or complementary to conventional diagnostics
 - Measures metastatic potential of cancer cellsDetermination of tumor type

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Development Stage:
-- Prototype

Publications:
KJ Meaburn and T Misteli. Locus-specific and activity-independent gene repositioning during early tumorigenesis. J Cell Biol. 2008 Jan 14;180(1):39-50.

Patent Status:
US (filed): Research Tool--This technology will not be patented.

Contact Information:
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Related Opportunities:

E-283-2008